

January 26, 2015
KAP 414
2:00 pm- 3:00

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“Viscosity solution of semi-linear path dependent PDE”

Abstract: The notion of viscosity solutions introduced by Ekren, Touzi and Zhang considers as test functions all those smooth processes which are tangent in mean. When restricted to the Markovian case, this definition induces a larger set of test functions, and reduces to the notion of stochastic viscosity solutions analyzed by Bayraktar and Sirbu. We take advantage of this enlargement of the test functions, and provides an easier proof of comparison. As a key ingredient for our methodology, we introduce a notion of punctual differentiation, similar to the corresponding concept in the standard viscosity solutions, and we prove that semimartingales are almost everywhere punctually differentiable. This smoothness result can be viewed as the counterpart of the Aleksandroff smoothness result for convex functions. We also developed recently an argument of Perron's method for the existence of the solution.